

PROCEEDINGS
OF THE
BIOLOGICAL SOCIETY OF WASHINGTON

NOTES ON SOME TROPICAL RANAE.

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The notes hereinafter to be presented are supplementary to Boulenger's monograph of American Ranae (Proc. Amer. Acad. 55, 9, 1920).

Rana vibicaria (Cope).

I took five adults, fifteen young and a tadpole of this little known frog while in Costa Rica in 1920. All the specimens came from small ponds in an old crater of Poas. This is now occupied by the tumble-down "lecheria" miscalled the "Hotel de Poas," and is at an altitude of about 7000-7500 feet.

(a) Comparison with the type of *Levirana vibicaria* Cope (Proc. Ac. Phila. 1894, p. 141) makes it apparent that these are the same. It is also quite evident that Boulenger was right in considering *Levirana vibicaria* identical with *Rana godmani* Guenther (Biol. Cent. Amer. Rept. p. 204, pl. 63, f. A, 1900).

(b) Boulenger says "lower parts white." In life the under surface of the hind legs was red.

(c) The young differ markedly in color being bright green above; sides shiny black; a white line along upper jaw; under surfaces of legs and concealed parts of hind legs red.

The grass around the small ponds was alive with these very beautiful little frogs, evidently recently transformed. The adult were rather shy and remained in the pond.

(d) The color of the young is strikingly similar to that of *R. caeruleopunctata*. Direct comparison of my specimens with some of *caeruleopunctata* which I caught at Navarro, Costa Rica, shows that the two are more closely allied than would appear from the arrangement in Boulenger, 1920. There the two are each left rather isolated and each compared with Old World species. *R. vibicaria* is the more aquatic of the two and has much the more restricted range as it is known only from three places in the high volcanoes of Costa Rica, while *caeruleopunctata* ranges over Costa Rica and Nicaragua.

The dorso-lateral glandular fold which is very wide in adult *vibicaria* is narrow in *caeruleopunctata* and in young *vibicaria*.

The tips of the toes are evidently swollen into disks in *caeruleopunctata* and in young *vibicaria*.

I fail to see any difference between adults of the two species in degree of separation of the outer metatarsals and should say that they were separated nearly to the base in both.

I should then put *vibicaria* in group II of Boulenger (which includes all the other tropical American Ranae) and regard it as both anatomically and geographically allied to *R. caeruleopunctata*.

(e) The tadpole of this species has not been described.

The specimen at hand has the hind legs already apparent and measures 70 mm. The tail is about twice as long as the body, rounded at the tip; interocular space equals width of mouth; black; tail light brown with circular black dots; teeth 6-4; the upper series marginal; the lower bordered by a row of papillae; the uppermost row uninterrupted and the three lowest uninterrupted.

This tadpole agrees with that of *Rana palmipes* rather than with any other described American tadpole, but has more numerous series of horny teeth above. The tadpole of *caeruleopunctata* is as yet unknown.

(f) Deckert (*Zoologica* II, No. 1, 1915) mentions *Rana godmani* from Costa Rica. The locality (Guapiles, 1000 ft.) is far too low for this frog and the color "greenish olive above with indistinct darker spots, and whitish below" does not agree with that of *vibicaria* and sounds suspiciously like that of *palmipes*.

Rana palmipes.

Boulenger (1920, p. 479) in his discussion of Cope's *Ranula chrysoprasina* says that no specimens of *R. palmipes* have ever been received from Costa Rica. This is due, of course, to the fact that Underwood's collections mostly came from the high central part of the country. That *palmipes* occurs in Costa Rica is shown by six specimens in the M. C. Z., collected by me at Zent, at Monteverde and at Guapiles.

Rana pustulosa.

A single female specimen from Ventanas, Durango, was all that was known of this frog when Boulenger wrote in 1920. In 1921, I was presented with a male specimen from Mazatlan, Sinaloa by Señor Doctor Carlos Cuesta Torron. It is now in the M. C. Z.

It differs from the male of *palmipes* in having external vocal sacs; the tympanum is nearly the size of the eye and separated from it by $\frac{1}{3}$ its own diameter; the tibiotarsal articulation reaches the eye; the heels do not overlap; there is a large horny pad on the inner side of the first finger.